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## Appendix D

### Upper Wolf River Basin Priority Inventory Site Summaries 2000 (including rare animal and plants documented in 1999-2000)

Inventory in the northern portion of the basin, demarcated by Hwy 29 in Shawano County, should be considered preliminary. For all but a few specific species only one field season of recent work has been completed. More comprehensive inventories at the natural community and species levels are needed to determine species distributions and site boundaries, as well as to better characterize this portion of the Wolf River Basin. The inventory planning and field survey methods are detailed in Appendix A.

#### Forest County

##### **Bog Brook State Wildlife Area** T34N R13E S25,36; T34N R14E 30

This site is primarily in state ownership and features a large *Carex* and *Sphagnum* dominated poor fen mat, and emergent marsh floating on a medium hard water, slightly acid flowage created by a six foot head dam on Bog Brook and maintained by Forest County. The associated marsh vegetation has a distinct zonation pattern, with a broad floating fen mat bordering the upland shore, giving way first to sometimes dense submergent aquatic beds and finally to an open water channel in the center. A wet mat of *Sphagnum* mosses underlies the marsh. Common or characteristic herbs include *Carex lasiocarpa*, *Calamagrostis canadensis*, *Campanula aparinoides*, *Potentilla palustris*, *Dulichium arundinaceum*, *Thelypteris palustris*, *Cicuta bulbifera*, *Onoclea sensibilis*, and discreet patches of *Typha angustifolia*. *Alnus incana* and *Betula pumila* are present in the shrub layer but are patchily distributed. The marsh occurs in a sand and gravel outwash plain within a rapidly developing, extensively forested matrix, along CTH DD just north of STH 52. The uplands surrounding the marsh have been intensively managed for timber; aspen and relatively young hardwoods are the current dominant cover types.

##### **Himley Lake** T34N R14E S4; T35N R4E S33

The site occurs within the Chequamegon - Nicolet National Forest, a few miles west of Wabeno in southern Forest County. The shore of this shallow, hard seepage lake is mostly upland with small inclusions of sedge meadow, alder thicket and boggier leatherleaf dominated areas. Characteristic species of the wetlands include: *Carex lacustris*, *C. stricta*, *Asclepias incarnata*, *Thelypteris palustris*, *Impatiens capensis*, *Alnus incana*, *Eupatorium perfoliatum*, *Aster borealis*, *Sium suave*, *Chamaedaphne calyculata*, *Larix laricina*. Submergent aquatic beds along the shore are sparse, and composed of with species including *Bidens* spp., *Potamogeton* spp., and *Najas flexilis*. An extensive wetland complex is also present along the outlet stream to its inlet at Roberts Lake. Development bordering the shore includes some drive-in campsites, an unpaved boat ramp and a single cabin on the northeastern corner of the lake. Uplands on all sides have been select cut and are dominated by a mix of aspen, paper birch, and maple with an occasional large white pine, hemlock or red oak. Intensive select cut management of the uplands and increased recreational use could threaten the water quality at this site. This lake should be considered for a non-motorized and electric motors only use restriction. The presence of freshwater sponges in the shallows of this lake is noteworthy. Two preliminary aquatic macroinvertebrate samples taken from the north and south ends of the lake yielded a somewhat low species richness value of four.

##### **Lily Lake Fen** T34N R13E S14,23

This privately owned site occurs on a ground moraine, three miles north of the Langlade County line, and just west of CTH DD. This wetland community is a high quality poor fen, occupying the southeastern most

shore of the lake and the lowland borders on both sides of the Lily River, continuing for  $\frac{3}{4}$  of a mile south of the lake. This hard water, slightly acid, drainage lake is impounded by a four foot head dam approximately one mile south of the Lily River outlet. The fen is shrub dominated with diverse low shrub and herb layers. Characteristic species include *Myrica gale*, *Betula pumila*, *Chamaedaphne calyculata*, *Potentilla palustris*, *Carex lasiocarpa*, *Larix laricina*, *Sphagnum* spp., and *Thelypteris palustris*.

There are dense beds of diverse submergent vegetation present in the river channel. The characteristic species include: *Nymphaea odorata*, *Nuphar variegata*, *Ceratophyllum demersum*, *Myriophyllum* sp., *Elodea canadensis*, *Najas flexilis*, *Potamogeton amplifolius*, *P. natans* and *P. robbinsii*. The uplands adjacent to the marsh have been developed with cottages, and in the surrounding area have been managed for timber or developed as low density residential areas. The lake is a popular fishing and boating spot. Continuing development of the surrounding area and a likely increase in boat traffic on both the lake and river may threaten the persistence of this community. This site should be a priority for acquisition or a conservation and management easement.

#### **Little Rice Lake T36N R12E S8-10 16**

This muck bottomed, soft water (M.P.A. 35-p.p.m.) drainage lake occurs on a ground moraine, within a state wildlife area located four miles northwest of Crandon. This impoundment was created by the 1936 installation of an 8 foot head dam at the outlet of the Wolf River. An extensive wild rice (*Zizania palustris*) bed of natural origin covers the northernmost portion of the flowage. This rice bed occurs with a diverse suite of associates including *Pontederia cordata*, and the submergent aquatics *Ceratophyllum demersum*, *Nymphaea odorata*, *Potamogeton natans*, *P. amplifolius*, *P. robbinsii*, *P. pectinatus*, *Myriophyllum* sp., and *Najas flexilis*. The water is light brown and moderate in transparency. The water depth in the rice stands is around a meter or so with the lake's maximum depth reaching over 3 meters. The rice bed has numerous channels meandering through its moderately dense stands. Even the densest stands are navigable with a canoe. There are duck blinds present on the emergent wetland edges though few ducks were during the August 2000 survey.

The wetland vegetation complex has distinct zones with Wild Rice (*Zizania palustris*) dominating the open water areas, a fairly diverse emergent marsh dominated by *Carex* and *Typha* sp., and more boggy areas with leatherleaf (*Chamaedaphne*) and tamarack prominent. The rice marsh borders uplands that are being used for timber production and residential purposes. Maintenance of the water levels, a minor exotic infestation of purple loosestrife, and increased recreational boating traffic are threats to this occurrence. Two special concern water beetles, a whirligig beetle (*Gyrinus impressicollis*) and a crawling beetle (*Haliphus pantherinus*) were documented from this site.

#### **Shoe Lake T34N R14E S16,21**

This site is located four miles west of Wabeno, within the Chequamegon - Nicolet National Forest. Most of the shoreline is in public ownership. A medium hard water spring lake, Shoe Lake has clear, alkaline water of low transparency. Three dwellings are present on private in-holdings on the shore of the lake. There are scattered beds of submergent aquatics, where *Nymphaea odorata*, *Nuphar variegata*, *Potamogeton natans* are the most prevalent species. The best development of these beds is near the outlet stream, which has been dammed by beaver a short way below the carry-in boat landing.

Along the southwestern and northernmost shores are boggy shrub dominated wetlands. The wetlands along the southern portion of the lake are small while more extensive *Chamaedaphne* dominated shrub swamp (muskeg grading into poor fen) forms a "cap" on the northern portion of the lake. Characteristic species include *Larix*, *Carex lasiocarpa*, *C. comosa*, *Calamagrostis canadensis*, *Sphagnum* sp., *Potentilla palustris*, *Typha* sp., *Dulichium arundinaceum*, *Hypericum pyramidatum*, *Muhlenbergia glomerata*, and *Galium tinctorium*. The small undeveloped island in the middle of the lake has a small moderate quality mesic forest

dominated by conifers with a very vigorous and extensive population of yew (*Taxus canadensis*). The uplands surrounding the lake are predominately second growth northern hardwoods with vigorous conifer regeneration (*Abies balsamea* and *Pinus strobus*) present along the shore. Due to recent increased development of the shoreline, the lake is no longer natural area quality. The bog areas along the northern edge of the lake should be protected from potential threats including increased wave action and water level manipulation.

## Langlade County

Sites along the main stem of the Wolf River progressing from the Langlade County line in the south to Town of Langlade wayside in the north.

### **Hanson Rapids - CTH M Woods** T31N R15E S31

This site is located along the west side of Wolf River and stretches from CTH M to the southern boundary Gardener Dam Boy Scout lands. This site is a rich northern mesic forest with a quite diverse complement of canopy trees, shrubs and herbaceous species. Local dominants include hemlock (*Tsuga*), and sugar maple (*Acer saccharum*), and important associates include beech *Fagus*, yellow birch *Betula alleghaniensis*, basswood *Tilia*, and balsam fir (*Abies balsamea*). The uplands beyond the 300', no-cut setback from the river have been selectively harvested previously. The stand classed as 15"+ D.B.H. northern hardwoods is marked for cutting, but the timber has not yet been sold (as summer 2000). There is a well-used footpath through the terrace forest right along the river that links up with the Boy Scout camp to the north. Hemlock stands with a depauperate groundlayer dominate the lower terrace along the river. Rich northern hardwoods occupy the gently sloping, silt loam capped pitted plains above the river corridor. Characteristic groundlayer species include *Sanguinaria canadensis*, *Actaea rubra*, *Adiantum pedatum*, *Arisaema triphyllum*, *Polygonatum biflorum*, *Claytonia virginica*, *Osmorhiza claytoni*, *Aralia nudicaulis*, *Trillium cernuum*, and *Aster macrophyllum*.

The upland forests surrounding this site have been managed for timber by select cutting. Second-growth northern hardwoods and aspen are the dominant cover types. The area to the west and south has been developed for recreational and low density residential uses.

This community type is very well represented on the Menominee Indian Reservation, only a short distance south of this site. However, when combined with neighboring forestlands to the north and east this site does provide an opportunity to develop a block of interior forest with older-growth characteristics. Consideration should be given to expanding the no-cut zone further away from the river or extending the timber rotations. Another option to consider is setting the area aside as a part of a large-scale natural area that could include the undeveloped Boy Scout lands to the north and east.

### **Gardner Dam Boy Scout / DNR Woods** T31N R14E S25, 26; T31N R15E S30;

The Gardener Dam Boy Scout Camp is a major landowner with significant in-holdings within the Wolf River State Fishery Area (WRSFA) boundary. Located along the Wolf River in southern Langlade County, this site is just upstream from the CTH M woods. It occupies the silt loam capped pitted outwash plain south of the river, the sandy loam capped gravelly hummock complex north of the river and lower mucky alluvial terraces bordering the Wolf River. This woods features a mixture of upland and lowland northern forest types of variable quality. Included are an old growth stand of hemlock hardwoods and a small, older growth character white pine stand, both are on the northern side of the river. Outside the 300' no-cut zone bordering the Wolf River, young aspen and northern hardwoods dominate. Within the river corridor on the loamy soils, second growth northern hardwoods and small stands of hemlock hardwoods are present. Characteristic species

include *Tsuga canadensis*, *Pinus strobus*, *Acer saccharum*, *Populus* spp., *Tilia americana*, *Dryopteris intermedia*, *Viola pubescens*, *Polygonatum biflorum*, *P. pubescens*, *Diervilla lonicera*, *Adiantum pedatum*, *Actaea pachypoda*, *Carex pensylvanica*, *Maianthemum canadense*, *Hydrophyllum virginianum*, *Athyrium filix-femina*, and *Caulophyllum thalictroides*. Cedar and black ash dominate the lower terraces and drainages. These stands are of moderate quality. The site is fragmented by logging access roads, well-worn paths, and camp facility development. The possible conservation actions for this site were described in the Hanson Rapids - CTH M woods summary. Small mammal trapping was conducted at this site but no rare species were documented.

#### **The Ledges** T31N R14E S35

This site lies within the WRSFA due west of Gardener Dam Boy Scout/DNR woods, at the intersection of pitted plains and unpitted alluvial terraces. It features a mixture of northern upland and lowland forest types. In the uplands, the northern mesic forests are dominated by *Tsuga* on the steep north facing slopes, and *Acer saccharum* or *Populus* spp. on the more gentle slopes and ridge tops. The lowlands bordering the river are seepy and springy, with bands of northern wet-mesic forest dominated by white cedar (*Thuja occidentalis*) and black ash (*Fraxinus nigra*). The upland forests occupying the slopes and ridge top are of variable quality with local areas of richer indicator species such as *Hydrophyllum virginianum*, *Caulophyllum thalictroides*, *Sanguinaria canadensis*, but with other areas characterized by early successional or regenerating species. The most prevalent herbaceous species in the upland forest include *Aster macrophyllus*, *Dryopteris intermedia*, *Lycopodium* spp. *Aralia nudicaulis*. The lowland terrace forests bordering the Wolf River are variable in area, canopy closure, and composition. They are seepy and springy with a fair diversity of groundlayer species including, *Glyceria striata*, *Carex leptalea*, *Phryma leptostachya*, *Chelone glabra*, *Eupatorium maculatum*, *Epilobium* sp., *Laportea canadensis*, *Onoclea sensibilis*, and *Impatiens capensis*.

Access and logging roads are present along the shore of the Wolf River and the upland forest has been logged previously. The dredge spoil islands created by DNR Fisheries are dominated by purple loosestrife and reed canary grass with a few common native wetland species as associates. Conversion of the surrounding uplands to agricultural fields, and residential/recreational uses combined with the emphasis on commercial timber production in the area have significantly limited the natural area qualities of this site. Extending the timber rotations in the area may offer potential for this site to contribute to the development and restoration of old growth forest characteristics along the Wolf River between STH 64 and CTH M.

#### **Spring Creek Woods** T31N R14E S26, 27, 35

This site lies within the WRSFA and surrounding uplands due west of the Ledges. The plant communities bordering this portion of the Wolf River include small pockets of alder thicket, spring runs, and more extensive stands of northern mesic and northern wet-mesic forest as well as hardwood swamp. The upland slopes and ridges in the southern portion of the site are characterized by extensive stands of regenerating 0-5" D.B.H. aspen; the second growth northern uplands are more intact with 5-11" D.B.H. *Quercus rubra* and *Acer Saccharum* dominating. Closer to the river, a narrow band of larger D.B.H. northern mesic forest is dominated by second growth *Acer saccharum*, *Abies balsamea*, and *Populus* species. The lowland terrace forest alternates between hardwood swamp dominated by *Fraxinus nigra* with an average D.B.H. of 5-11" (in a local stand they reach almost 20"), and northern wet-mesic forest stands dominated by *Thuja*. Small *Tsuga* inclusions are present on slightly higher microsites. These low terraces are generally springy and seepy with frequent moss covered boulders, as well as hummock and hollow topography. Some of the *Thuja* stands have fairly sizable blowdowns. These swamps are rich in groundlayer species with numerous prevalent and characteristic species including *Impatiens capensis*, many *Carex* spp., *Athyrium filix-femina*, *Onoclea sensibilis*, *Cystopteris bulbifera*, and *Caltha palustris*.

A network of access and logging roads is present in the uplands. Much of the area outside the 300' no-cut zone has been clear cut or intensively select cut. The surrounding uplands are currently used for abandoned and active agricultural fields (hay, pasture, and sunflower), low density residential and recreational

development, and timber production. These neighboring land-uses have significantly limited the conservation values of this site. Extending the timber rotations in the area may offer potential for this site to contribute to the development and restoration of old growth forest characteristics along the Wolf River between STH 64 and CTH M. This portion of the Wolf River is used intensively by rafters, canoe/kayakers, and anglers.

#### **Twenty day rapids** T31N R14E S22, 23

This site lies within the WRSFA and is the next site north from the Spring Creek area. It is an existing but unmapped site in the Natural Heritage Inventory database with good survey information from the original county survey in the early 1980's. Due to our emphasis on sites with little or no previous documentation, the interior of this site was not visited in person. But, from visits to the northern and southern most portions of this area and the examination of aerial photos, it is apparent that a high quality closed canopy, large, mature cedar swamp is still intact at this site.

#### **Spaulding access to bend above Twenty Day Rapids** T31N R14E S15, 22, 23

Located just above Twenty Day Rapids on the western side of the river, this site is located on an unpitted outwash plain and alluvial terrace. The communities bordering this section of the Wolf River between Horserace and Twenty Day Rapids, are combination of lowland forests, thickets and predominately disturbed upland forest types. In the narrow bands of swampy and springy areas, alder thicket, and cedar or black ash swamps dominate. Some of the typical swamp understory species are present including *Mitella nuda*, *Onoclea sensibilis*, *Dryopteris cristata*, and *Circaea alpina*, but disturbance indicators such as *Laportea canadensis* are also present. Selectively cut, small diameter northern hardwoods dominate the more extensive uplands. Sugar maple (*Acer saccharum*), which dominates away from the river, paper birch (*Betula papyrifera*), red maple (*Acer rubrum*), balsam fir (*Abies balsamea*) and hemlock (*Tsuga canadensis*), are prevalent canopy species closer to the river. Sugar maple (*Acer saccharum*) dominates the subcanopy throughout the uplands. Prevalent sapling and seedling species include American elm (*Ulmus americana*), beech (*Fagus grandifolia*), red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*). The groundlayer is relatively depauperate with characteristic species including *Aster macrophyllus*, five *Lycopodium* spp., *Vaccinium myrtilloides*, *Pteridium aquilinum*, *Osmorhiza claytoni*, and *Hepatica americana*.

The surrounding uplands have been intensively managed for timber and developed for low density residential and recreational uses. The condition of the site as well as that of the surrounding forest lands significantly limits the conservation values of this site. It may hold some potential as part of a long-term landscape scale restoration of natural process-driven forest and wetland communities along the Wolf River between STH 64 and CTH M.

#### **Rocky Rips Road to Horserace Rapids cedar swamp and uplands** T31N R14E S10, 15

This site is located on a rocky pitted outwash plain and alluvial terrace east of the Wolf River. It stretches from the bottom of Crowle Rapids to the private in-holding south of Horserace Rapids. This site is a mix of highly disturbed to relatively undisturbed northern forest community types, including northern dry-mesic, northern mesic and northern wet-mesic forest stands. The rolling, more upland slopes and higher terraces, both closer to and further away from the river, feature a diverse suite of canopy species with local dominants that include sugar maple (*Acer saccharum*), hemlock (*Tsuga canadensis*), and aspen (*Populus* spp.). Interesting or important canopy and subcanopy associates include *Ostrya*, *Carpinus*, *Picea glauca*, *Pinus strobus*, *Abies balsamea*, and *Quercus rubra*.

The least disturbed portions of this site are the northern wet-mesic forest stands located on the lower terraces and at the base of the sloping outwash plain. Canopy coverage in these stands is variable, but the high quality portions have developed an "old growth character", with many down and leaning cedar trees, and natural gaps with dense local sapling sized regeneration of *Abies*, *Thuja*, and *Tsuga*. These stands are dominated by cedar (*Thuja occidentalis*). Black ash (*Fraxinus nigra*), yellow birch (*Betula alleghaniensis*), and hemlock

(*Tsuga canadensis*) are common local canopy and subcanopy associates. The d.b.h.'s average in the range of 5"- 15", with 20" d.b.h. plus individuals of *Pinus* and *Tsuga* also present. The ground is covered with moss-covered boulders forming hummock and hollow microtopography. Characteristic species include *Coptis groenlandica*, *Equisetum scirpoides*, *Ribes lacustre*, *Solidago flexicaulis*, *Athyrium filix-femina*, *Dryopteris cristata*, *Mitella nuda*, *Asarum canadense*, *Pyrola secunda*, *Circaea alpina*, *Clintonia borealis*, *Trientalis borealis*, *Viola renifolia*, *Aralia racemosa*, and mosses other than *Sphagnum* spp..

The surrounding uplands are managed intensively for timber and the current forest is a mixture of second growth northern forest types. Species composition and sandy soils offer potential to manage at least a portion of the uplands at this site for white pine and red oak. This option should be given serious consideration. Intensive agricultural and low density residential developments are also present in the nearby uplands. This site does connect with variable quality conifer and hardwood stands that are present along the alluvial terrace, and outwash plains. Recreational uses of this portion of the Wolf River include canoeing and kayaking, and fishing.

#### **Larzelere Rapids** T31N R14E S4

Just upstream from the STH 64 crossing of the Wolf River, this portion of the WRSFA is highly disturbed. Tree felling by beaver and commercial timber harvesting are the main influences on the composition and structure of this forest. This site is situated on an outwash plain and alluvial terrace and the forest near the river is dominated by a mix of young aspen (*Populus tremuloides*), sugar maple (*Acer saccharum*), and yellow birch (*Betula alleghaniensis*), with cedar (*Thuja*) and hemlock (*Tsuga*) as minor associates. Average d.b.h.s are in the 5"-9" range, and there are many stumps as well as evidence of charring present. Seepy areas and spring runs are frequent on the lower slope. The upland slopes have been selectively cut and the canopy is fairly open. The forest on top of the slope is richer and dominated by sugar maple (*Acer saccharum*) in both the canopy and subcanopy, and hazelnut (*Corylus cornuta*) in the shrub layer. Associates include white ash (*Fraxinus americana*) in the canopy, and yellowbud (*Carya cordiformis*) in the sapling and seedling layers. Prevalent groundlayer species include *Aster macrophyllus*, *Pteridium aquilinum*, *Clintonia borealis*, *Rubus* sp., *Lycopodium obscurum*, and *Dryopteris intermedia*. Little coarse woody debris is present, mostly as fallen trunks.

Within this portion of the fishery area the uplands have been cleared and are now old field and fallow agricultural lands. On the adjacent lands, low density residential development, agriculture, and timber production are the main land-uses, and in this area they significantly altered the surrounding uplands and river. This section of the river is heavily used for recreational purposes including kayaking, canoeing, rafting and fishing.

#### **Hemlock/Cedar Rapids** T32N R14E S31, 32

This site is located within the WRSFA between the carry in public access parking lot off of STH 55, a mile south of Ninemile Hill and the bend below Oxbow Rapids. It occupies a rocky, pitted, rolling outwash plain and alluvial terrace bordering along the Wolf River. The site is a mosaic of northern mesic, northern wet-mesic, and hardwood swamp stands with moderate to high conservation values. The hemlock (*Tsuga canadensis*) stands occur on the intermittent higher drier terraces and slopes above the river within the WDNR's 300' "aesthetic management" (no-cut) zone. D.B.H.s average in the 15"-20" range, and a number of 20" plus d.b.h. individuals are present. Though these stands have over 70% canopy closure, there is little in the way of structural diversity. There are only sparse areas of sapling (*Abies*) regeneration, though there is fair amount of coarse woody debris present locally, both as standing snags and fallen trunks. The ground, seedling, and sapling layers are depauperate and generally have extremely low cover values, and *Tsuga* needle duff is the dominant ground cover. Characteristic species include *Tsuga canadensis*, *Maianthemum canadense*, *Lonicera canadensis*, *Clintonia borealis*, *Lycopodium lucidulum*, *L. obscurum*, *Monotropa uniflora*, and *Dryopteris intermedia*.

The undisturbed northern wet-mesic forest stands are dominated by cedar (*Thuja occidentalis*), and the hardwood swamp is dominated by black ash (*Fraxinus nigra*). These types occur on the lower terraces adjacent to the river, at the base of slopes or in lower basins away from the river, respectively. D.B.H.s average in the 5"-11" range with individuals reaching over 15". *Betula alleghaniensis* and *Abies balsamea* are the most common canopy and subcanopy/sapling associates.

Though these stands have variable canopy coverage, some structural diversity, including both coarse woody debris and standing snags, is present, although development is not exceedingly complex. There are patches of seedling and sapling sized regeneration but only spotty small seedlings of cedar are present; most of the regeneration is of *Fraxinus* spp. and *Abies*. The ground is seepy and boulder laden, with many pools, and hummock and hollow microtopography. The groundlayer is diverse, with characteristic species include *Rubus pubescens*, *Onoclea sensibilis*, *Caltha palustris*, *Lonicera canadensis*, *Carex intumescens*, *C. disperma*, *C. leptalea*, *Glyceria* sp., *Epilobium ciliatum*, *Circaea alpina*, *Mitella nuda*, *Dryopteris cristata*, and *Equisetum sylvaticum*.

The stands at this site vary in width with respect to the local topography, and at times stretch beyond the WDNR's 300' aesthetic management (no-cut) zone. There are scattered inclusions of alder thicket in seepages and along the river. The surrounding uplands are managed intensively for timber and the cover type is second or third growth northern hardwoods, with sugar maple and aspen as the most prevalent species. Intensive agricultural and low density residential developments are also present in the nearby uplands. This site does connect with other conifer and hardwood stands, in variable condition, that are also present along the alluvial terrace. Recreational uses of this portion of the Wolf River include canoeing, kayaking, and fishing.

#### **Oxbow Rapids Hemlock Hardwoods**      032N014E S30

This site is located 2.7 miles north of Langlade on STH 55, embedded in forested landscape along corridor of Wolf River. The Bear Caves State Natural Area is located 1 mile to the east and Oxbow Rapids State Natural Area is across the river to the west. Ownership is predominantly public (WDNR- Wolf River State Fishery Area) but also includes some private forest crop land. This second-growth mesic hemlock-hardwood forest is of moderate size (99 acres), but mature with no signs or recent disturbance, good context and significant microhabitat diversity. Set in the bottoms, on steep slopes, and on the plateau of the east bank of the Wolf River, the highest quality part of site is a nearly pure, older second-growth 12"-18" D.B.H. stand of hemlock (ca. 20 acres) at the tip of "oxbow". This stand has a sparse understory and groundlayer, and some seeps with white cedar are present. The remainder of the site (farther north and east) is sugar maple-dominated, hardwood forest (with scattered conifers, mainly hemlock, balsam fir) with yellow birch and basswood frequent associates. No beech was seen. Trees here range from 6"-14" d.b.h., with some up to 24". Sugar maple saplings are locally common in the shrublayer. The following species are common in the groundlayer: maiden-hair fern (*Adiantum pedatum*), wild sasparilla (*Aralia nudicaulis*), lady fern (*Athyrium filix-femina*), silvery spleenwort (*A. thelypteroides*), sedges (*Carex leptoneura*, *C. pedunculata*, *C. pensylvanica*), blue-bead lily (*Clintonia borealis*), wood fern (*Dryopteris carthusiana*), Virginia water-leaf (*Hydrophyllum virginianum*), Canada mayflower (*Maianthemum canadense*), sweet cicely (*Osmorhiza claytonii*), broad beech fern (*Phegopteris connectilis*), false melic grass (*Schizachne purpurascens*), zig-zag goldenrod (*Solidago flexicaulis*), early meadow-rue (*Thalictrum dioicum*), large-flowered trillium (*Trillium grandiflorum*), downy yellow violet (*Viola pubescens*). In spots, the understory is richly mesophytic with blue cohosh (*Caulophyllum thalictroides*), common name for genera???(*Dicentra* spp.), Canadian white violet (*Viola canadensis*), and plantain-leaved sedge (*Carex plantaginea*).

The plateau-top on the east edge of the site is very rugged with deep, steep-sided potholes filled in spots with piles of glacial erratic boulders. There has been no recent logging entry. This section of the river corridor

receives heavy recreational use (canoes/kayaks and rafts). Two old, infrequently used logging roads traverse the site from east to west and terminate at the Wolf River. The main uses of surrounding lands are commercial forestry and recreation, including seasonal residences, hunting, fishing, canoeing/rafting. Deer browse is moderate to heavy at this site and may alter vegetation composition and successional trends over time. Other threats include invasion by exotic species such as garlic mustard, and disturbance due to ATVs.

Site protection recommendations include maintenance of gated restrictions on motorized access from STH 55. Consideration should be given to the deferring or lengthening logging rotations, as well as management for old growth characteristics. Explore possibilities of connecting this site with the Bear Caves SNA to the east, as the intervening area appears to have a rugged, jumbled bouldery, forested topography that may be difficult to conduct forestry on. A linkage with Oxbow Rapids SNA to the west is also a legitimate consideration.

#### **Hollister Bridge (Ninemile Rapids) to Burnt Point Rapids** T32N R13E S24; T32N R14E S19

This site is located within the WFSFA on an alluvial terrace and hummocky end moraine bordering the west bank of the Wolf River. The natural communities present here include a high quality cedar swamp and upland inclusions dominated by hemlock (*Tsuga canadensis*) close to the river, and second-growth sugar maple (*Acer saccharum*) and paper birch (*Betula papyrifera*) away from the river. This site is bounded by intensively managed forest to the west. Characteristic species in the rocky cedar swamp include *Thuja occidentalis*, *Fraxinus nigra*, *Taxus canadensis*, *Trillium cernuum*, *Lonicera canadensis*, *Solidago flexicaulis*, *Oxalis montana*, *Cystopteris bulbifera*, and *Ribes lacustre*. A large blow-down has occurred at the northern edge of the swamp along the bottom of Burnt Point Rapids. A beaver dam on a spring run in that same area is flooding out the swamp forest to the northwest. The intensive timber management in the uplands to the west and south diminishes the natural area qualities of this site.

#### **Burnt Point Rapids to Little Sheen Rapids (on the west side of the river)** T32N R13E S11, 12, 13

The site is a mosaic of northern mesic and northern wet-mesic forest and hardwood swamp communities occupying a low, alluvial terrace along the Wolf River. The upland forests are second growth and dominated by 9-11" D.B.H. sugar maple (*Acer saccharum*). White and green ash (*Fraxinus americana* and *F. pennsylvanica*), yellow birch (*Betula alleghaniensis*) and aspen (*Populus* spp.) are canopy associates. The subcanopy and sapling layers are moderately developed, with white spruce (*Picea glauca*) and black cherry (*Prunus serotina*) in the subcanopy, and sugar maple in the sapling layer. The extensive swampy area has many spring runs flowing into the river, and has been greatly impacted by flooding associated with beaver activity. The swamp is quite variable in composition due to minor changes in microtopography and the resulting differences in the depth to the water table.

In the areas with standing water, small D.B.H. black ash (*Fraxinus nigra*) is the canopy dominant, *Cornus stolonifera* and *Alnus incana* are the most common shrubs. The canopy is very open and there are many small D.B.H. standing snags. Characteristic groundlayer species include *Typha*, *Carex* sp., *Eupatorium maculatum*, *E. perfoliatum*, *Impatiens capensis*, *Cirsium muticum*, and *Lycopus uniflorus*. Cedar (*Thuja occidentalis*) dominates the slightly higher areas, and balsam fir (*Abies balsamea*) is an important associate, D.B.H.s average 5"-9" in these stands. Red maple (*Acer rubrum*) and black ash (*Fraxinus nigra*) are present in the subcanopy. The ground is springy and most of the area is underlain by Sphagnum mosses. Characteristic groundlayer species include *Rhamnus alnifolia*, *Carex intumescens*, *Trientalis borealis*, *Coptis groenlandica*, *Dryopteris cristata*, *Ribes lacustre*, *Mitella nuda*, *Glyceria striata*, and *Sphagnum* sp.

The uplands surrounding the site are intensively managed for commercial timber production, with relatively small D.B.H. (5"-11") aspen and northern hardwoods dominant. These lands are a combination of industrial, private, and publicly-owned forestlands. There is an extensive network of logging roads traversing the uplands and bisecting the swamp itself. Overall, between the beaver activity and intensive timber production in the adjacent uplands, the natural communities in this area have been significantly altered. Removal of

some of the beaver dams may lead to the development of a more closed canopy forest in the low lying areas. An extension of the timber rotation in the surrounding uplands is a long-term consideration in this area to complement the extensive lowland forest types present.

**Big and Little Sheen Rapids (east side of the river)** T32N R13E 11, 12

This stand is located on a rocky unpitted outwash plain and alluvial terrace southeast of the public access on Wolf River Road. The lower rocky hummock and hollow swales and dry terraces just above the river are dominated by cedar (*Thuja occidentalis*), with black ash (*Fraxinus nigra*) as a local associate. Characteristic species in the mucky soiled, boulder strewn, springy swamp portion include *Rhamnus alnifolia*, *Cystopteris bulbifera*, *Gaultheria hispidula*, *Linnaea borealis*, *Mitella nuda*, *Dryopteris cristata*, and *Sphagnum* spp. On the slightly more upland sites away from the river, the disturbed but richer northern hardwoods are dominated by sugar maple (*Acer saccharum*), basswood (*Tilia americana*), green ash (*Fraxinus pennsylvanica*), hemlock (*Tsuga canadensis*), white spruce (*Picea glauca*) are canopy associates. Subcanopy species include *Carpinus*, *Ostrya*, *Tsuga*, and *Betula papyrifera*. Pockets of regeneration of balsam fir, sugar maple and basswood, are common and these even include some small natural gaps created by windthrow. A great diversity of species is present in the seedling and sapling layers including *Abies balsamea* which is the most prevalent species, *Betula alleghaniensis*, *Acer rubrum*, *Thuja* and *Tsuga*. Characteristic species of the upland stand include *Athyrium thelypteroides*, *Adiantum pedatum*, *Aralia nudicaulis*, *Carex pensylvanica*, *Actaea* sp., *Aster macrophyllus*, *Dryopteris intermedia*, and *Taxus canadensis*.

Logging and the removal of cedar woody debris have taken place throughout the stand, though a small amount of down coarse woody debris does persist locally. A well traveled footpath runs south along the river from the access parking lot, and multiple access roads lead through the forest to the river. Throughout the site, evidence of substantial browse pressure is present on sensitive herbaceous and woody species such as *Thuja*, and *Tsuga* seedlings, and sparse low *Taxus* clones which are few in number and stunted in growth form. This stand is surrounded by low density residential development, old fields, and intensively managed forestlands. The rich groundlayer may suggest that the site deserves consideration for the extension of timber harvest rotations on the upland portions of the site. The stand would also benefit from the closure of the multiple access roads traversing the stand southeast of the public access parking lot. This portion of the Wolf River is the most popular with recreational boaters.

**Little Slough Gundy north to Big Slough Gundy Rapids** (Lawton tract M.F.L. and DNR lands) T32N R13E S2, 3

This site is located on an unpitted outwash plain and alluvial terrace bordering the Wolf River. A portion of this site was documented in the original county survey by DNR-Research in the early 1980's with a note that further inspection was desirable. The area encompassed here is a mixture of fairly narrow bands of cedar swamp, and more extensive upland hardwood forest. The upland parts of the stand have been managed under the DNR's Managed Forest Law program. While the stand retains a diverse suite of canopy and groundlayer species including *Athyrium thelypteroides*, *Adiantum pedatum*, *Caulophyllum*, *Allium tricoccum*, the structure and composition of this tract is now predominantly influenced by the timber management. The hemlock stands have a fairly typical, depauperate groundlayer, and they occupy the steeper slopes. Yew (*Taxus*) is present here. Characteristic species of the upland forest stands include *Dirca palustris*, *Osmorhiza claytonii*, *Aralia nudicaulis*, *Carex pensylvanica*, *Actaea* sp., *Aster macrophyllus*, *Dryopteris intermedia*, and *Taxus canadensis*.

The DNR lands to the north are dominated by small D.B.H. aspen and northern hardwoods, with small patches of hemlock (*Tsuga*) and yellow birch (*Betula alleghaniensis*) present on the steep side slope. Sedges and grasses, particularly *Carex pensylvanica*, dominate the groundlayer. Overall the cedar swamp remains in good condition but the upland forest could be considered for management deferral to allow the further development of characteristics that are the result of natural versus human-made processes.

A state threatened dragonfly, the pygmy snaketail, is documented from the Wolf River in this area.

**CTH A to Town of Langlade Wayside Park** T33N R12E S13, 15, 16, 22, 23, 24; T33N R12E S17, 18, 19, Unpitted terraces and outwash plain landforms characterize this stretch of the Wolf River. The wetland plant communities bordering this section are of mixed quality. The very upper and lower portions of this river section have class two rapids, while the middle of this stretch is generally of lower gradient than elsewhere in the county. This has allowed a relatively extensive, yet vegetatively simple, emergent marsh, and smaller, species poor submergent aquatic beds to develop. The forests along this segment include extensive black ash (*Fraxinus nigra*) dominated hardwood swamps, mixed conifer dominated wetland forests with a boreal character (white spruce (*Picea glauca*) and balsam fir (*Abies balsamea*) are important associates in these stands) and smaller cedar (*Thuja occidentalis*) dominated northern wet-mesic forests. Reed canary grass and purple loosestrife are present along this river section, particularly in the emergent wetlands. Some of the adjacent uplands have been managed for timber and the river shore is mostly undeveloped, with only a few cabins and a road bordering the middle portion. Two gravel quarries are present in the Squaw creek area, and the groundlayer of the cedar forests in public waysides have been degraded by trampling and erosion that have denude the groundlayer along the river. The forests and wetlands bordering this stretch of river should be more thoroughly inventoried.

Langlade County sites not located on the main stem of the Wolf River.

**Crestwood Sugarbush** T31N R12E S28, 33

This site is located 2.5 miles south of Polar on both sides of Crestwood road, and on the west side of Polar road. It is privately owned and was surveyed from the road only. This sugarbush is a 110 acre, select-cut mesic forest on rolling, hummocky glacial drift, embedded in a predominantly agricultural landscape. Sugar maple is the canopy dominant, with trees to 18" D.B.H. present. Hemlock, basswood, elm, black cherry are also common, and the understory is varies from open to well-stocked with sugar maple seedlings. There is a well developed, lush spring and showy herbaceous layer, with large flowered trillium (*Trillium grandiflorum*), wild blue phlox (*Phlox divaricata*), Canadian and downy yellow violets (*Viola canadensis*, *V. pubescens*), wild ginger (*Asarum canadense*), dutchman's breeches (*Dicentra cucullaria*), lady fern (*Athyrium filix-femina*), Virginia water-leaf (*Hydrophyllum virginianum*), wild leek (*Allium tricoccum*), blue cohosh (*Caulophyllum thalictroides*), false rue-anemone (*Isopyrum biternatum*), large-flowered bellwort (*Uvularia grandiflora*), broad-leaved toothwort (*Dentaria diphylla*), zig-zag goldenrod (*Solidago flexicaulis*). Some old, low-grade logging lanes are visible and the least disturbed area is along the north side of Crestwood road

**County Line Oaks** T34N R12E S3, T35N 12E S34

This red oak dominated forest stand is located on the crest of a drumlin, within the Langlade County Forest, east of STH 55 and just south of Mole Lake. The site has been selectively cut recently, leaving a fairly monotypic stand of red oak. The shrub layer is dense and relatively species rich; *Corylus*, *Hamamelis*, *Viburnum acerifloium*, *Acer rubrum* and *Rubus sp.* are prevalent. Characteristic groundlayer species include *Pteridium*, *Thalictrum dioicum*, *Polygonatum pubescens*, *Streptopus roseus*, *Aralia nudicaulis*, and *Diervilla lonicera*. This stand and the surrounding forested uplands have been intensively managed for timber products and developed with an extensive network of A.T.V. trails. An intact swamp of cedar and alder borders this site on the east. This site has been included in this inventory because it is an underrepresented community type within the basin, however better examples may exist elsewhere in the basin.

**Demlow Lakes Swamp** 030N012E S3

This site is located 5.5 miles southeast of Antigo, on Hill road 3 miles south of STH 64. It is part of a State Fishery Area managed by the WDNR. It is located in a matrix of agricultural and commercial private forestry land. This is a small (15 acre) but undisturbed white cedar-dominated seepage swamp with spring runs

surrounding the small, undeveloped Demlow lakes, Maxwell Springs, and the headwaters of Mayking Creek, a tributary of the Red River. Cedar is dominant, mostly ranging from 3"-15" D.B.H., with some trees and very old cut stumps reaching 30"D.B.H. Balsam fir, yellow birch, and hemlock are locally frequent and in the same size range. Old stumps are present but there has been no recent cutting. Deer browse vulnerable species such as yew (*Taxus*) and blue-bead lily (*Clintonia*) are abundant (and appeared healthy) in the understory, and locally there is cedar and hemlock regeneration. The general health and integrity of the forest (including lack of deer browse in an agricultural matrix) is noteworthy.

The best seeps and spring runs are at the northern and northwestern end of upper Demlow Lake, with cold, shallow water flowing over a sandy bottom. Frequent understory species are lady fern (*Athyrium filix-femina*), wood ferns (*Dryopteris* spp), long stalk sedge (*Carex pedunculata*), blue-bead lily (*Clintonia*), oak fern (*Gymnocarpium*), orange jewelweed (*Impatiens capensis*), Canada mayflower (*Maianthemum*), naked miterwort (*Mitella nuda*), northern wood sorrel (*Oxalis montana*), and bulbet bladder fern (*Cystopteris bulbifera*). Some semi-open hillside seeps at the far northwestern property line have purplestem angelica (*Angelica atropurpurea*), shining aster (*Aster firmus*), fowl meadow grass (*Poa palustris*), mint (*Mentha*), swamp thistle (*Cirsium muticum*), and golden ragwort (*Senecio aureus*). Small fenlike mats on the shores of lower Demlow lakes have, panicled sedge (*Carex diandra*), spikerushes (*Eleocharis* spp.), great water dock (*Rumex orbiculatus*), marsh-marigold (*Caltha palustris*), bog willow-herb (*Epilobium leptophyllum*), and round-leaved monkey flower (*Mimulus glabratus*). The main use of the site is for recreation, predominantly fishing and hunting.

### **Elmhurst Maples** T30N R11E S29

This site is located 5.25 miles south, southwest of Antigo on the west side Old 26 Road. It is privately owned and was surveyed from road only. It is embedded in a matrix of agricultural land, rapidly developing residential areas, and moderately to heavily select-cut hardwood forests. This small ( 45 acre) but very rich older second growth forest composed mostly of hardwoods is located on a rolling, hummocky, southwest to northeast trending moraine separating the Wisconsin and Wolf River drainages. The dominant trees are 8"-21" D.B.H. sugar maple, with individual trees reaching up to 27". Basswood and white ash are frequent associates, while hemlock is uncommon, and butternut rare (a single 8" tree was seen). The understory is generally open, lacking dense thickets of maple saplings, brushy gooseberries (*Ribes* spp.) and bramble (*Rubus* spp.). The understory is very rich and free of exotic species, with wild leek (*Allium tricoccum*), large-flowered trillium (*Trillium grandiflorum*), and Virginia water-leaf (*Hydrophyllum virginianum*) dominant. Other frequent species include blue cohosh (*Caulophyllum thalictroides*), dutchman's breeches (*Dicentra cucullaria*), leatherwood (*Dirca palustris*), broad-leaved toothwort (*Dentaria diphylla*), long-beaked sedge (*Carex sprengelii*), sweet cicely (*Osmorhiza claytonii*), white trout lily (*Erythronium americanum*), wild blue phlox (*Phlox divaricata*), Carolina spring-beauty (*Claytonia caroliniana*), downy yellow violet (*Viola pubescens*), large-flowered bellwort (*Uvularia grandiflora*), and false rue-anemone (*Isopyrum biternatum*). No recent disturbance was noted. Consideration of special protection is warranted, as so few examples of older successional stages of this forest type have been formally protected.

### **Emil Springs area** T32N R12E S30-32

This site is located three miles east of Lily. The DNR property at the spring is at the intersection of a till plain and postglacial organic sediment deposits. The site is a disturbed mosaic of northern upland and lowland forests, including an open pond created by a beaver dam, and surrounded by alder thicket. There are many species indicative of the springy nature of the site. Characteristic species include *Platanthera hyperborea*, *Symplocarpus foetidus*, *Carex* sp. and *Mitella nuda*. The uplands are intensively managed for timber, and small (5"-11") D.B.H. northern hardwoods now dominate. The surrounding privately-owned uplands have also been intensively managed for timber products; aspen and young hardwoods are the dominant cover types there. Many logging roads traverse the area. The beaver activity combined with the intensive timber

production in the adjacent uplands has significantly altered both uplands and wetlands within the site, and surrounding lands. The main conservation value of the site is the public ownership of the spring itself.

#### **Evergreen State Fishery Area** T31N R14E S30, 31

This DNR-owned site is located southeast of CTH P on unpitted outwash terraces and plains, and alluvial terraces bordering the Evergreen River. The upland forests are second growth, dominated by sugar maple (*Acer saccharum*) and trembling aspen (*Populus tremuloides*) with balsam fir an important understory species. Yellow birch (*Betula alleghaniensis*) is present locally. Sedges, particularly Pennsylvania sedge (*Carex pensylvanica*) dominate the groundlayer. Other groundlayer species present in the uplands include clubmosses (*Lycopodium* spp.) and dogbane (*Apocynum androsaemifolium*). The lowlands bordering the river are springy with a mix of open canopied forest and alder thicket. Local dominants include black ash (*Fraxinus nigra*), red maple (*Acer rubrum*), cedar (*Thuja occidentalis*) and alder (*Alnus incana*).

Characteristic groundlayer species include *Arisaema triphyllum*, *Osmunda cinnamomea*, *Thalictrum dasycarpum*, *Carex intumescens*, *Sambucus* sp. *Caltha palustris*, *Platanthera psycodes*, *Viola* sp., *Athyrium filix-femina*, and *Equisetum sylvaticum*. Blowdowns are common near the river, where springy rivulets run from the base of the upland slope. While the river in this area is aesthetically pleasing, it has been altered by the many road crossings upstream. This site should be retained in public ownership due to its value and use as a fishery area. The surrounding uplands have been developed for low density residential and agricultural uses.

#### **Florence Lake** T31N R13E S32, 33

The portion of this site visited is owned by a Girl Scout camp. It occurs due south of Elton at the interface of an alluvial terrace and till plain. The plant communities present in and around Florence Lake have been disturbed by commercial timber production, development of recreational facilities, low density residential housing and cabins. The forested uplands occupying the steep slopes and ridges are second or third growth northern hardwoods, dominated by trembling aspen. The swampy lowlands bordering the lake and Drew Creek are dominated by 5"-11" D.B.H. cedar (*Thuja occidentalis*) over a rather homogeneous groundlayer characterized by *Carex leptalea*, *Dryopteris cristata*, *Aralia nudicaulis*, *Ribes lacustre*, *Carex disperma*, and *Abies balsamea* saplings growing on a carpet of mosses. A small emergent marsh is present at the mouth of Drew Creek; prevalent species include *Sparganium eurycarpum*, *Carex* spp., *Scirpus validus*, *Sagittaria* spp., and *Asclepias incarnata*. Both the inlet and outlet of the lake are silty with submergent and floating-leaved aquatic stands dominated by *Nymphaea odorata*, *Nuphar variegata*, *Ceratophyllum*, *Ranunculus longirostris*, *Potamogeton* spp., and *Myriophyllum* spp.

The eastern side of the lake and northern portion of the outlet stream have been developed with cottages, and there has been significant clearing of shoreline vegetation. The uplands within the Girl Scout camp have been logged at least once, and some large areas have been permanently cleared for the development of camp facilities. An equipment house and dock are present on their lake frontage. Most of the surrounding uplands have either been intensively managed for timber products or developed for recreational or residential uses. This intensive management and development of the surrounding uplands threaten the viability of the natural communities there. The western shore as well as inlet and outlet streams should be protected from further development.

#### **Goto Lake** T31N R12E S22, 23

This site occurs on a collapsed hummocky gravel moraine complex and unpitted gravel plain, three miles southeast of Antigo. This State Fishery Area has a fairly complicated vegetation mosaic. The forested wetland occupying the peaty sediments near the lake is dominated by cedar (*Thuja*) and yellow birch (*Betula alleghaniensis*) over a carpet of Sphagnum mosses. Characteristic herbs include *Carex trisperma*, *Dryopteris cristata*, *Cornus canadensis*, and *Clintonia borealis*. The open canopied, forested wetland away from the lake has widely spaced tamarack (*Larix laricina*), black

spruce (*Picea mariana*), and red maple (*Acer rubrum*) over an understory dominated by *Sphagnum*, *Eriophorum*, and *Carex* species. This wetland borders a small pond created by beaver, is dominated by *Nymphaea odorata*, and bordered by a small emergent marsh characterized by more nutrient demanding species such as *Typha angustifolia*, *Carex lacustris*, *Scirpus cyperinus*, and *Dulichium arundinaceum*. The uplands to the west of the lake are relatively unremarkable managed northern mesic forest of variable condition. Closer to the lake and access road, the loam capped gravel ridges and ravines are dominated by sugar maple (*Acer saccharum*), with basswood (*Tilia americana*), yellow birch, and hemlock (*Tsuga canadensis*) as canopy associates. The site has little structure or coarse woody debris and the D.B.H.s average 5"–9". While the understory retains a few individuals of some species indicative of a relatively rich site conditions such as *Caulophyllum thalictroides*, *Arisaema triphyllum* and *Sanguinaria canadensis*, the dominant species are ferns, grasses, and sedges, especially *Dryopteris intermedia* and *Carex pensylvanica*. The forest occupying the ridge and ravine away from the lake is more intact with the larger D.B.H. (11+" ) canopy trees of the species mentioned above but with a richer, more diverse ground flora including silvery spleenwort (*Athyrium thelypteroides*). A small floristically depauperate alder thicket borders the inlet stream to the north.

There are stumps near the lake that suggest that trees were removed to facilitate fishing access. The upland mesic forest has been selectively harvested in the recent past, and the residual D.B.H.s top out around 11". A well-developed access road is present, as are numerous stumps and patches of disturbance species such as Wood Nettle. The uplands in the far western portion of the site are open weedy fields. The surrounding uplands have been significantly altered through the conversion of forestland to agricultural and residential uses. The upland forests at this site have limited restoration potential. Possible considerations include lengthening the timber harvest intervals to retain and enhance the "rich" groundlayer species component, develop more forest structure, and maintain the diversity of canopy trees

#### **Miniwakan Lake and Peatlands** T34N R11E S24,25, 35, 36

Located on Langlade County Forest land south of Lower Post Lake, this site is an extensive peatland complex formed on an outwash plain and includes a XXX acre XXX lake. Two major plant communities are present, muskeg and poor fen. The muskeg has scattered stunted black spruce (*Picea mariana*) and tamarack (*Larix laricina*) underlain by a continuous layer of *Sphagnum* mosses. Hummock and hollow microtopography characterizes the surface, with species composition varying between the higher "drier" hummock tops and the lower hollow sides and bottoms. Black spruce dominates the open "canopy" while tamarack is more commonly present as regeneration. Ericaceous shrubs are common throughout the site *Ledum*, *Kalmia polifolia*, and *Chamaedaphne* are the most prevalent. Other characteristic species include *Carex oligosperma*, *C. paupercula*, *C. trisperma*, *C. pauciflora*, *C. canescens*, *Eriophorum angustifolium*, *E. vaginatum*, *Gaultheria hispidula*, *Vaccinium oxycoccos*, *V. angustifolium*, *Andromeda glaucophylla*, *Smilacina trifolia*, *Dryopteris cristata*, and *Drosera rotundifolia*. This muskeg is noteworthy due to its size, its public ownership, and its context within a landscape mosaic of other high quality peatland communities.

As you head west to the lake, the muskeg grades into a narrow band of tamarack swamp, and then ultimately into a large undisturbed, poor fen mat that surrounds Miniwakan Lake. The fen is sedge dominated (*Carex diandra*, *C. stricta*, *C. lasiocarpa*, *C. interior*) grading into shrubby thickets of bog birch (*Betula pumila*) or stands of cattails (*Typha* spp.). Prevalent or characteristic species of this fen are bog rosemary, bog laurel, small cranberry, pitcher plant, bog muhly (*Muhlenbergia glomerata*), cotton grasses, rose pogonia (*Pogonia ophioglossoides*), blue-joint grass, marsh cinquefoil (*Potentilla palustris*), leatherleaf and horned bladderwort (*Utricularia cornuta*) and the special concern species, swamp-pink (*Arethusa bulbosa*). Two additional special concern plants, common bog-arrow grass (*Triglochin maritima*) and sparse-flowered sedge (*Carex tenuiflora*) are also present in the fen mat.

Most of the surrounding upland forest has been clearcut, or selectively logged, which has significantly altered their composition and structure. An extensive network of logging roads is present on the county forest owned lands, while on the site itself an A.T.V trail runs through the forested upland along the

wetland's northeastern shore. In the managed forest stands aspen, young hardwoods, and locally, pine, are the dominant trees. For the most part, the remaining uplands have undergone residential development. Measures should be taken to protect the hydrology of this site from disruption due to surrounding land-uses or water table manipulation.

The surveys targeting invertebrates along the eastern edge of the muskeg in the Miniwakan Lake complex yielded three special concern species of butterflies, including jutta arctic (*Oeneis jutta*), bog fritillary (*Boloria eunomia*), and bog copper (*Lycaena epixanthe*). An additional special concern butterfly, the tawny crescent spot (*Phyciodes batesii*) is documented from the cut-over mixed pine forest on sandy soils, with grasses, hawkweed (*Hieracium* spp.), clover and hazel (*Corylus* spp.), bordering the eastern edge of the bog/muskeg. A state endangered dragonfly, the warpaint emerald (*Somatochlora incurvata*), is also documented from this site, in an open bog/muskeg near several small bog pools, with black spruce (*Picea mariana*), tamarack (*Larix laricina*) and leatherleaf (*Chamaedaphne*) among the characteristic plants.

#### **Moose Lake Springs (VIEWED BY CANOE) T30N R12E S16**

Located 5.5 miles southeast of Antigo, this site is privately owned and was surveyed from canoe only. It contains a 32 acre second-growth tamarack (rich) swamp, foresting the shores and islands of a calcareous spring complex at the headwaters of the Red River on the west end of Moose Lake. The dominant trees are 2"-6" D.B.H. tamarack and, in some places, white cedar. The tall shrub understory includes abundant *Alnus incana* and the exotic *Rhamnus frangula*, while low understory shrubs include *Cornus stolonifera*, *Betula pumila*, *Salix* spp (*S. candida*, *S. serissima*, and others), and *Ledum groenlandicum*. *Carex diandra* dominates the understory, and other frequent species are *Calamagrostis canadensis*, *Campanula aparinoides*, *Impatiens capensis*, *Scirpus atrovirens*, *Thelypteris palustris*. Other characteristic species are *Galium labradoricum*, *Asclepias incarnata*, and *Sphenopholis intermedia*. Channels present within the site are mucky and marly, with cold seepage water. Characteristic aquatic macrophytes associated with this habitat are *Ranunculus aquatilis*, and *Mimulus glabratus*, the exotic *Nasturtium officinale*, *Typha latifolia*, and *Utricularia vulgaris*. No rare plant species were noted.

Moose Lake Springs is embedded in a privately owned mix of agricultural, commercial forest, and residential land. Moose Lake is a 140 acre drainage lake with seasonal and permanent housing developments along both the north and south shores. The lake receives heavy recreational use, which apparently does not impact the site because of shallow water in the spring seepage area. The main threat is the continued expansion of the invasive glossy buckthorn. Reed canary grass is also present but is currently only a minor problem.

#### **Ninemile Creek T32N R14E S17, 18**

This site is located just east of Hollister on alluvial terrace and hummocky complex landforms bordering Ninemile Creek as it drains to the Wolf River. Communities present are disturbed alder thicket and northern wet-mesic forest. The alder thicket stretches along the course of Ninemile Creek all the way to its confluence with the Wolf River. It has a moderately diverse groundlayer that is dominated by grasses and sedges (*Carex* spp.), and includes *Alnus incana*, *Calamagrostis canadensis*, *Carex stricta*, *Aster novae-angliae*, *Urtica dioica*, *Phalaris arundinacea*, and *Chelone glabra*. Away from the creek, northern wet-mesic forest is present, dominated by *Thuja*, with *Abies balsamea* and *Fraxinus nigra* as associates in the sub-canopy and sapling layers. This forest has fairly pronounced hummock and hollow microtopography and the characteristic groundlayer species include *Coptis groenlandica*, *Dryopteris cristata*, *Poa palustris*, *Rubus pubescens*, *Pyrola secunda*, and *Sphagnum* and brown mosses.

There has been some cutting in the forested portion of the site, and reed canary grass dominates along the creek banks. Roads and residential development bound Ninemile Creek to the east and south, and the creek passes through numerous culverts before reaching its outlet at the Wolf River. It is likely that these developments have significantly altered the hydrology of this site. Land use practices and developments appear to be permanent and afford little hope to fully restore the site's hydrology. The intrusion of reed

canary grass along the creek threatens the maintenance of native wetland vegetation at this site and throughout the Ninemile Creek corridor. Prescribed burning may be a useful management tool here.

#### **Perch Lake** T30N R12E S8, 17

This State Fishery Area (SFA) is located in the Town of Norwood, several miles north of STH 47, in an area of rolling sand and gravel outwash plains. The majority of the site is upland forest, of variable disturbance history. Overall, sugar maple (*Acer saccharum*) is the dominant species on the ridge top and away from the lake, with yellow birch (*Betula alleghaniensis*) a locally common sapling and subcanopy associate. Hemlock (*Tsuga canadensis*) forms a narrow band along the slope surrounding the entire lake. At the south end of the lake a wetland forest inclusion of tamarack (*Larix laricina*) and red maple (*Acer rubrum*) is present. Under the maple the groundlayer is moderately rich, with characteristic species such as *Sanguinaria*, *Asarum*, *Caulophyllum*, and *Adiantum* present. Other, more disturbed portions of the forest, are grass and sedge dominated with *Carex pensylvanica* and *Brachyelytrum erectum* forming a rather simple carpet-like groundlayer. Under hemlock the groundlayer is very depauperate, with *Lycopodium* spp and *Dryopteris* ferns dominant.

There is an access road running from Trout Rd across the Red River which passes through a culvert and through the upland forest down to the lake. There is a spruce plantation to the north, and logging has taken place throughout most of the uplands within the fishery area. The surrounding uplands have been developed for low density residential use and timber production. The maintenance of an access road has encouraged unintended recreational uses of the site by local landowners, namely horseback and A.T.V. riding on the trails. The site would benefit from closure of the road and an extension of the timber harvest rotation to favor development of a more closed canopy forest.

#### **Spider Creek Wetland complex** T34N R12E S17-20, 29, 30

This site, located east of Lower Post Lake, includes a diversity of natural community types. The quality and condition of the communities is variable. The major communities present are northern sedge meadow, muskeg, and black spruce swamp. There are minor inclusions of poor fen, alder thicket, northern wet-mesic and dry-mesic forests, submergent and floating-leaved aquatic communities. The wetland vegetation bordering the creek has a typical zonation. The communities grade from sedge meadow, to shrub-carr and alder thicket, then to northern wet-mesic forest away from the creek. The tussock and lake sedge (*Carex lacustris* and *C. stricta*) dominate the sedge meadow, with *Calamagrostis canadensis* the most prevalent associate. The alder thicket and northern wet-mesic forest support a diverse understory. Prevalent species include *Betula pumila*, *Eupatorium maculatum*, *Impatiens capensis*, *Stellaria longifolia*, *Caltha palustris*, *Potentilla palustris*, *Onoclea sensibilis*, *Sphagnum* spp., and many species of *Carex*. The extensive muskeg and swamp bordering the flowage to the east has variable canopy cover dominated by *Picea mariana* with regenerating *Larix laricina* as an associate. Canopy coverage ranges from 0 to over 60%. The groundlayer is depauperate, and characteristic species include *Ledum*, *Eriophorum angustifolium*, *E. virginicum*, *Chamaedaphne*, *Carex oligosperma*, *C. disperma*, and *Sphagnum* spp. A brief herptile survey in a portion of this complex documented wood frogs (*Rana sylvatica*) and the special concern species, the four-toed salamander (*Hemidactylium scutatum*).

Spider Creek has been dammed and bermed to form Spider Creek Flowage. Further downstream it passes through a culvert under Lost Lake Road. Reed canary grass is beginning to intrude upstream into the sedge meadow/shrub-carr at the outlet into the Wolf River. The upland forests surrounding the wetland complex have been extensively logged to regenerate aspen and red pine plantations have been established. A.T.V. trails and logging roads traverse much of the upland area. The flowage is maintained for waterfowl production and to provide hunting opportunities. The extensive clearcut, early successional forest management of the surrounding uplands may impact the hydrology and water quality of the neighboring wetlands and contribute to the lack of regeneration of the browse sensitive species present, such as white

cedar. There is restoration potential for sedge meadow, poor fen, and shrub communities at this site, if the dam and berm are removed from the flowage outlet.

## Marathon County

### **Mud Lake Muskeg** T28N R10E S 9,10,15,16

This site is located 3.5 miles northeast of Hatley. It is privately owned and was surveyed from canoe and roadsides only. It is a large (194 acre), acid muskeg between Mud Lake to the west and Mayflower Lake to the east-southeast, that is part of the large (1500 acre), Mud-Mayflower Lake wetland complex. A small (3 acre) bog pond, called bluegill lake, is embedded within this site. The muskeg is characterized by scattered small tamarack and black spruce trees overtopping a dense low shrub layer of *Chamaedaphne*, *Aronia*, *Nemopanthus*, *Ilex*, and *Ledum*. The groundlayer is densely sphagnum, and includes *Carex oligosperma*, *Thelypteris palustris*, *Osmunda cinnamomea*, *Calamagrostis canadensis*, and *Iris versicolor*. Mud Lake has beds of *Pontederia*, *Brasenia*, and *Typha* along shoreline.

Surrounding lands include an unsurveyed swamp believed to be dominated by tamarack, Mud Lake, and developed agricultural and residential lands. There is a public boat landing used for fishing access and one permanent residence at the southeast corner of Mud Lake.

### **Norrie Lake Wetlands** T28N R10E S21 and 22

This site is located 7 miles northwest of Wittenberg. The surveyed area is privately owned and mostly along the north side of the Mountain-Bay State Bike Trail. The primary community is a large (278 acre), mature conifer swamp forest about 1 mile long and 0.25 mi wide, mostly north of the mountain-bay state bike trail. White cedar and tamarack are co-dominant and range from 3"-10" D.B.H., and up to 10 meters in height. The understory varies from brushy with tag alder, bog birch, and swamp buckthorn near the trail, to quite open, deeply sphagnum, and floristically rich in the swamp's interior. Common species include *Carex leptalea*, *Cornus canadensis*, *Glyceria striata*, *Rubus pubescens*, *Thelypteris palustris*, *Carex interior*, *C. stricta*, and *Polygonum arifolium*. Within 50-100 meters of the old railroad grade the understory is very wet, suggesting impeded drainage with *Caltha palustris*, *Carex stricta*, and *C. utriculata* common. Farther away from the right-of-way the hydrology is apparently undisturbed. Two rare plant species are documented at this site, the state-threatened *Valeriana uliginosa*, and the special concern *Carex gynocrates* are present. Overall floristic diversity is excellent with rare calciphiles present and few or no exotic plants noted.

Four species of rare, special concern butterflies were documented at this site: Jutta arctic (*Oeneis jutta*), bog copper (*Lycaena epixanthe*), dion skipper (*Euphyes dion*) and the mulberry wing (*Polanes massasoit*). All four were found to be most common on the north side of the Mountain-Bay Bike Trail where bog graded into brushy sedge marsh.

The surrounding landscape includes a vast acidic, sphagnum dominated muskeg that borders the bike trail on the south side. This wetland complex is embedded within predominantly agricultural lands, with managed forests to the north, and partly developed Norrie Lake to the southeast. There are no apparent threats aside from continued disruption of the hydrology by the bike trail (on an old railroad grade). However, this disruption may partly maintain the character of this site and the muskeg to the south of the trail. This may be the largest, most intact peatland in Marathon County and should receive high priority for protection.

## Shawano County

#### **Cranberry Lake wetlands** T29N R12E S18

This site is located northeast of Birnamwood and is part of a large, privately owned complex of forested and shrub wetland communities. The exterior portion of the site is a mix of deciduous and coniferous wetland types disturbed by ditching, drainage and logging. The herbaceous and woody flora of the site is fairly diverse, with small D.B.H. (2"-9") black ash (*Fraxinus nigra*), white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), tag alder (*Alnus incana*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*) dominating locally, and canopy closure ranges from 5 to 70 percent. Prevalent groundlayer species include *Carex crinita*, *C. intumescens*, *Onoclea sensibilis*, *Calamagrostis canadensis*, *Osmunda cinnamomea* and *Aralia nudicaulis* in the more nutrient rich areas, and *Smilacina trifolia*, *Nemopanthus mucronatus*, *Eriophorum virginicum*, *Carex oligosperma*, *Drosera rotundifolia*, *Ledum*, *Andromeda* and *Sphagnum* spp. in the lower nutrient "boggy" areas.

The upland inclusion and portions of the low swamps have been logged. The owner noted that large D.B.H. tamarack had been removed. The land uses in the surrounding uplands are residential development, agriculture, and commercial forestry. Effects of the hydrological disruption from ditching and drainage include invasion by reed canary grass on the western edge of the site. There may be some restoration potential but the hydrologic disruptions may be difficult to reverse. Intensive agricultural development of the neighboring uplands may also limit potential.

#### **Herman Swamp** T27N R14E S15

This privately owned site is located between STH 29 and Gresham on a ground moraine or outwash plain. The hydrology has been drastically altered by the construction of a highway across the middle of the site, as well as access roads into the eastern interior. It is a somewhat fragmented complex of predominately northern wet-mesic forest (cedar swamp), with inclusions of hardwood (black ash) swamp. In spite of the disturbed hydrology, this minerotrophic swamp has classic hummock and hollow microtopography. Prevalent or characteristic species include *Osmunda regalis*, *Eupatorium maculatum*, *Symplocarpus*, *Rubus pubescens*, *Carex leptalea*, *Carex lacustris*, and *Galium triflorum*. There is a small upland inclusion with stands of large D.B.H. hemlock (*Tsuga*) and dense pole-sized exclusion stage beech (*Fagus*). The CTH U right-of-way is mowed up to the forest edge. Some logging has taken place and is most noticable in the upland inclusions. Surrounding upland land use includes low density residential development, agriculture and commercial forestry. The only exotic noted was reed canary grass, which was present in the hardwood swamp, in the site's interior.

#### **Mattoon Swamp** T29N R11E S8, 17, 18

This privately owned swamp complex is located just southeast of Aniwa on a ground moraine. The site is a mosaic of shrub thickets and open canopied, wetland forest communities. While the herbaceous and woody flora of these areas are fairly diverse; the main factor influencing these portions of the site is hydrologic disturbance. In the disturbed portions of the site, the dominant canopy and shrub species change frequently and include *Thuja occidentalis*, *Fraxinus nigra*, *Picea mariana*, *Larix laricina*, and *Alnus incana*. The ground layer ranges from being quite species rich where *Alnus*, *Fraxinus*, and *Thuja* dominate to depauperate in the *Picea* and *Larix* dominated areas. Characteristic species include *Osmunda regalis*, *Typha angustifolia*, *Eupatorium maculatum*, *Symplocarpus*, *Carex leptalea*, *Carex lacustris*, *Galium triflorum*, *Thelypteris palustris*, *Ilex verticillata*, *Dryopteris cristata*, *Impatiens capensis*, *Maianthemum canadense*, and *Sphenopholis intermedia*. The interior of the site does harbor a high quality open bog and muskeg complex. The ericaceous shrub, *Chamaedaphne* is the overwhelming dominant here with *Larix* and *Picea mariana* present at low cover values. Associates include *Sphagnum* moss, *Ledum*, *Andromeda*, *Vaccinium macrocarpon*, *V. oxycoccos*, *Carex paupercula*, *C. trisperma*, *C. oligosperma*, *Smilacina trifolia*, and *Eriophorum virginicum*.

The hydrology has been drastically altered by the construction of highways and access roads, within or bordering all but the eastern most portion of the site. Non-commercial logging has taken place in the

wetland, and the northern mesic forest upland inclusion in the middle of the site has been selectively logged. The southern most portion of the stand appears to have been grazed. The land use in the surrounding uplands includes residential, recreational, and forestry.

The affects of the hydrological disruption from road construction are apparent in all but the most interior portion of this site. Exotic species were absent. While this is a species rich complex, only the interior portions have potential for the conservation of intact natural communities. The site should be protected from further disruptions of its hydrology.

#### **Aquatic features and habitat types in the upper Wolf River Basin** (excerpted from Schmude's 2000 Aquatic Macroinvertebrate Inventory)

##### **Very Large Rivers**

Two very large rivers in the upper Wolf River Watershed were sampled, the Wolf and Red rivers. High species richness values (40-53) and abundance of aquatic macroinvertebrates were found, similar to what was discovered in the lower Wolf River Watershed in 1999, when values of species richness of 38 to at least 80 were recorded. Two outstanding sites on the upper Wolf River were located at Wolf River Landing Road (Langlade Co.) and Meister-Stuckley Road (Oneida Co.). The Wolf River at Chaney Lane (Forest Co.) did not produce species richness values or abundance data that were as high as other sites along the Wolf River. This site seemed to be disturbed, with dark algal mats covering the rocks, and a perceived water quality of only fair. It is not clear what might be causing this disturbance. The site on the Red River was located at the canoe landing near Gresham where the waterfall area exists. This site was particularly difficult to sample due to high water, raging currents, and bedrock substrates. Undoubtedly, species richness would have been much greater at this site if a more thorough effort could have been accomplished.

##### **Medium to Large Rivers**

Thirteen medium to large rivers were sampled throughout the entire Wolf River basin. Species richness ranged from 18 in Ninemile Creek (Langlade Co.) to 71 in the Embarrass River (Shawano Co.). Most appeared to have good water quality, with high species richness and include those species that were intolerant to organic enrichment.

##### **Small to Medium-sized Streams**

A total of 37 different streams in this category were sampled throughout the entire Wolf River basin. Taxa richness values ranged from 5 in Pearl Creek (Portage Co.) to 47 in Krause spring and creek (Langlade Co.), but there were very few new county records discovered for species. Low richness values for Pearl, Allen (Portage), and an unnamed creek (SCH063-Waupaca Co.) (Table 1) may not necessarily be attributed to man-made disturbance, but perhaps to very cold temperatures and lack of suitable, heterogeneous substrates. Overall, most of the streams indicated very good water quality, with many of the same taxa present in most of the streams.

##### **Lakes**

Twenty different lakes were sampled for aquatic invertebrates within throughout the Wolf River basin. Species richness values ranged from 4 at Himley Lake's south end (Forest Co.) to 38 in Fountain Lake (Portage Co.). Obviously, lakes within the same general area and with the same general size have macroinvertebrate communities that vary in abundance and diversity, and understanding what contributes to this disparity is very difficult.

Two lakes were of special interest, Lawrence Lake in Langlade County and Little Rice Lake in Forest County. Lawrence Lake is undeveloped, except for a dirt road and boat landing. The water is very clear with rubble, submerged logs, short macrophytes, and sand along the littoral zone; some quieter bay areas have muck and emergent vegetation. A fairly diverse (34 species richness) and abundant macroinvertebrate fauna occurred on a variety of the substrates that were present. Little Rice Lake is located near the

headwaters of the Wolf River. The lake had an abundant and diverse macroinvertebrate fauna (37 species richness), which was probably due to diverse habitats and substrates. Collecting was limited to one boat landing on this complex lake. It is likely that the documented species richness would increase dramatically with a more thorough sampling effort.

## **FUTURE INVENTORY**

Aquatic invertebrates of the upper Wolf River Basin remain under sampled. This part of the basin would certainly benefit from more extensive and thorough surveys comparable to the effort that was focused on aquatic habitats in the Lower Wolf River Bottomland Natural Resources Area.

## **Rare animals documented in 1999-2000, at other sites in the upper Wolf River Basin, listed by county**

### **Forest County**

#### **Little Long Lake T34N R14E S19**

A special concern butterfly, the bog copper (*Lycaena epixanthe*), was documented from an isolated bog with leatherleaf (*Chamaedaphne*), labrador tea (*Ledum*) small cranberry (*Vaccinium oxycoccos*), and few-seeded sedge (*Carex oligosperma*).

#### **Pedro Creek wetlands T35N R11E S32**

A population of the special concern butterfly, the dorcas copper (*Lycaena dorcas*), was documented in an area of bog that had graded into a mucky alder and willow shrub swamp vegetated with species including sedges, yarrow, clover and cattail.

#### **Pine Lake Outlet Swamp T37N R12E S34**

Two special concern insects a dragonfly, the forcipate emerald (*Somatochlora forcipata*) and a skipper, Laurentian skipper (*Hesperia comma*) are documented in a sedge, alder, willow, spruce and maple wetland and meadow opening bordering the Wolf River.

### **Langlade County**

#### **Langlade County Forest – Ainsworth Bog T34N R12E S31 NW4SE4**

Populations of three special concern butterflies, the bog copper (*Lycaena epixanthe*), laurentian skipper (*Hesperia comma*), and bog fritillary (*Boloria eunomia*) and a single individual of the special concern dragonfly the black-tipped darner (*Aeshna tuberculifera*) were documented in a muskeg and bog pond with sphagnum mosses, cottongrass (*Eriophorum* spp.), cranberry (*Vaccinium* spp.), and pitcher plants (*Sarracenia purpurea*).

#### **Langlade County Forest – Lost Lake Road Uplands T34N R12E S28,29**

A special concern butterfly, the tawny crescent (*Phyciodes batesii*), was documented at this site in sandy forest openings vegetated with red and jack pine (*Pinus resinosa*, *P. banksiana*), hawkweed (*Hieracium* spp.), grasses, and clover.

## Shawano County

### **Lulu Lake** T27N R16E S12

Two special concern, aquatic insect species were documented at this site, the dragonfly, swamp spreadwing (*Lestes vigilax*) and a crawling water beetle (*Haliphus pantherinus*).

### **North Branch Embarrass River** T28N R12E S26

A special concern dragonfly, the zebra clubtail (*Stylurus scudderi*) was documented at this site.

### **Red River - Gilmer Falls** T27N R15E S6

A special concern dragonfly, the slender bluet (*Enallagma traviatum*) was documented at this site.

### **Westcott Township** (Norton Drive, Woods Road Pines and CTH HH) T27N R16E S4, 5, 8

Colonies of the special concern tiger beetle species (*Cicindela patruela patruela*) were documented at two sites, along Norton Drive and Woods Road Pines about four miles north-northeast and northeast of the city of Shawano. A closely related, special concern tiger beetle species (*Cicindela patruela huberi*) was documented seven miles northeast of Shawano along CTH HH. Leonard's skipper (*Hesperia leonardus leonardus*), a special concern skipper was also present at the Woods Road Pines site. These species were documented in openings of dry, sandy, mixed hardwood and pine woodlands vegetated with species including pines (red, white and/or jack), black oak, big bluestem, blazing star, brown mosses, and Pennsylvania sedge.

## Discussion

The natural communities documented in this report are, for the most part, highly representative types for the northern Wolf River basin. In Langlade County, extensive documentation was compiled for the natural communities bordering the main stem of the Wolf River. The predominant communities were cedar and black ash swamps on the lower alluvial terraces, and northern mesic forests on the higher terraces and slopes adjoining the river. The adjoining, fairly intact cedar swamps occupying most of the lower terraces along the Wolf River in Langlade County are of regional and possibly statewide significance from the perspective of landscape scale management potential. This is because the majority of these swamps along the river are already within public ownership as part of the Wolf River State Fishery Area, and little recent disturbance has occurred. In addition, many of the private in-holdings are under state directed cooperative management programs such as Managed Forest Law. To some extent, however, the conservation values of these swamps are limited by the narrowness of the protected corridor (there is only a 300' setback until lands can undergo active timber management), and by the intensive nature of the timber management in the adjoining uplands. At almost every site inventoried, the forests beyond the 300' setback had been either select or clear cut recently enough that the effects of the timber harvest were still major factors in determining composition and structure of the stands.

The secondary impacts of these management practices may be manifesting themselves in the swamps and terrace forests. Regeneration of species that are preferred as browse, such as cedar and hemlock, is virtually nonexistent at sites inventoried throughout the upper basin, with only a few sites having individuals that have survived to the recruitment stage. If this trend continues, the long-term persistence of the current natural communities present is questionable.

There were some exemplary stands of both cedar and hemlock present within the study area. A few of these sites had been documented as part of the Langlade County natural areas inventory conducted by DNR's Bureau of Research in the early 1980's. These include Hemlock/Cedar Rapids and the Lawton tract. Additional high quality examples not documented in the original survey include swamps at Horserace and

Burnt Point Rapids. Due to their small size and landscape context, the sites themselves are only of local and regional significance.

With the exception of the Menominee Reservation, not covered in this study, hemlock stands were not common in inventoried parts of the upper basin either along the river corridor or in the upland forests away from the Wolf River. Where these stands exist they are small in extent. Due to the rarity of this type, existing stands would be considered of local and regional significance, and should be explicitly considered in any planning done for the basin. The uplands away from the river have been and are used for commercial timber production, and the residual stands, although extensive, are of only moderate to low quality from a natural community perspective. Only two stands of upland forest bordering the Wolf River were of interest from the natural area perspective. The first, Gardener Dam Camp Woods, (also known as the Boy Scout Mesic Forest) was documented in a previous county inventory. It is one of only a hand-full of upland forest stands in the entire northern Wolf River basin that has developed old growth characteristics. This stand is of local, regional, and statewide importance. The location and condition of this site presents an opportunity to restore a larger block of older growth forest if it is combined with neighboring Boy Scout and DNR owned forest lands. One notable DNR owned forest in this area is the Hanson Rapids - CTH M woods, located to the southwest of the Gardener Dam Camp on the west side of the Wolf River just north of the CTH M bridge. This forest block has a rich complement of hardwood and conifer species including yellowbud, hemlock, yellow birch, and beech. This is northern forest community is well represented on the Menominee Indian Reservation just a short distance to the south.

Away from the Wolf River the overall quality of sites was highly variable. The most important site in this group was Little Rice Lake. The northern half of this lake harbors a naturally occurring wild rice bed that is of statewide significance because it is natural in origin, large, and occurs within a context of high quality wetland types including submergent aquatic, emergent aquatic, and muskeg communities.

Additional sites of regional significance include the Spider Creek wetland complex, Bog Brook Wildlife Area, and Miniwakan Lake peatlands. These sites also large wetland complexes that occur on publicly owned lands, and they have very good examples of muskeg, sedge meadow, and poor fen communities. Norrie Lake wetlands and Lily Lake fen also fall in this group due to their high quality species rich, northern wet-mesic forest and poor fen communities respectively. Though there is no public ownership at these sites, which are located within rapidly developing areas, conservation planning is a priority. This could include the acquisition or the negotiation of conservation and management easements.

Of local significance are the oak stands in the drumlin rich region of northernmost Langlade County. Due to the difficulty in locating the owners of undeveloped parcels of this type, only one stand was visited. The stand had been recently managed through selective cutting and lacked structure and large diameter trees but could recover to provide a habitat type that is poorly represented, by older age stands with high canopy closure, in the basin. The Shawano County sites (Herman Swamp, and Cranberry Lake Wetlands) and the Langlade sites (Goto and Florence Lakes) also fall within this category due to the multiple disturbances that limit their restoration potential, including logging, neighboring land-use effects and hydrologic disruption. The undeveloped lakes and river stretches including Perch Lake, Evergreen River SFA, and Ninemile Creek are also important, locally significant sites that should be protected and restored where possible. Intrusions including access roads, bridges, road crossings, and residential and recreational developments currently limit the potential conservation values of these sites.

Priority inventory sites in the northern Wolf River basin that were not included in this study due to time limitations include Mud Creek Meadows (adjoining Lower Post Lake), Lake Lucille and Pedro Creek (NEH02) in Oneida County, sites within the Menominee and Stockbridge Reservations, and the extensive meadows bordering the Wolf River south of Pine Lake (NEH01).

Many sites need additional inventory to better document the natural communities present or surveys for rare plants and animals; these include the Wolf River section between CTH A to the Town of Langlade, Twenty Day Rapids, Burnt Point and Horserace Rapids, Bog Brook Wildlife Area, Lily Lake fen, Little Rice Lake, Spider Creek Wetlands, Crestwood Sugarbush, Elmhurst Maples, Norrie Lake Wetlands and Mud Lake Muskeg.